If Emulation of Another System Is Necessary, Ensure that It Is as Correct and Complete as Possible

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Incorrect or incomplete emulation can introduce vulnerability.

Description

In general, an emulation fidelity vulnerability exists when

- a system must emulate another system or device,
- that emulation is incorrect or incomplete, and
- the system uses the emulated state information to make security decisions.

The defect might be some or all of the following:

- Emulation that is too abstract. Many network-based intrusion detection systems passively watch traffic of other systems, trying to guess the state of end nodes in communications with one another based on communication fragments. Packet-based firewalls in certain configurations exhibit this same shortcoming. For both of these examples, complete emulation is not generally possible because many end-node policies that influence their state are not observable in the traffic.
- The emulator is simply wrong (i.e., logic error) and does not emulate the original correctly.
- The eumlation is correct, but it does not perform in realtime. That is, it cannot keep up with what it's emulating, resulting in a denial of service.

References

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[VU#548515] Finlay, Ian. *Vulnerability Note VU#548515: Multiple intrusion detection systems may be circumvented via %u encoding*. http://www.kb.cert.org/vuls/id/548515 (2003).

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